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(54) **RETAINING ARTICLE FOR WHEEL  
ORNAMENTATION AND METHOD OF  
MAKING**

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37.33, 37.35, 37.42, 37.29, 37.38

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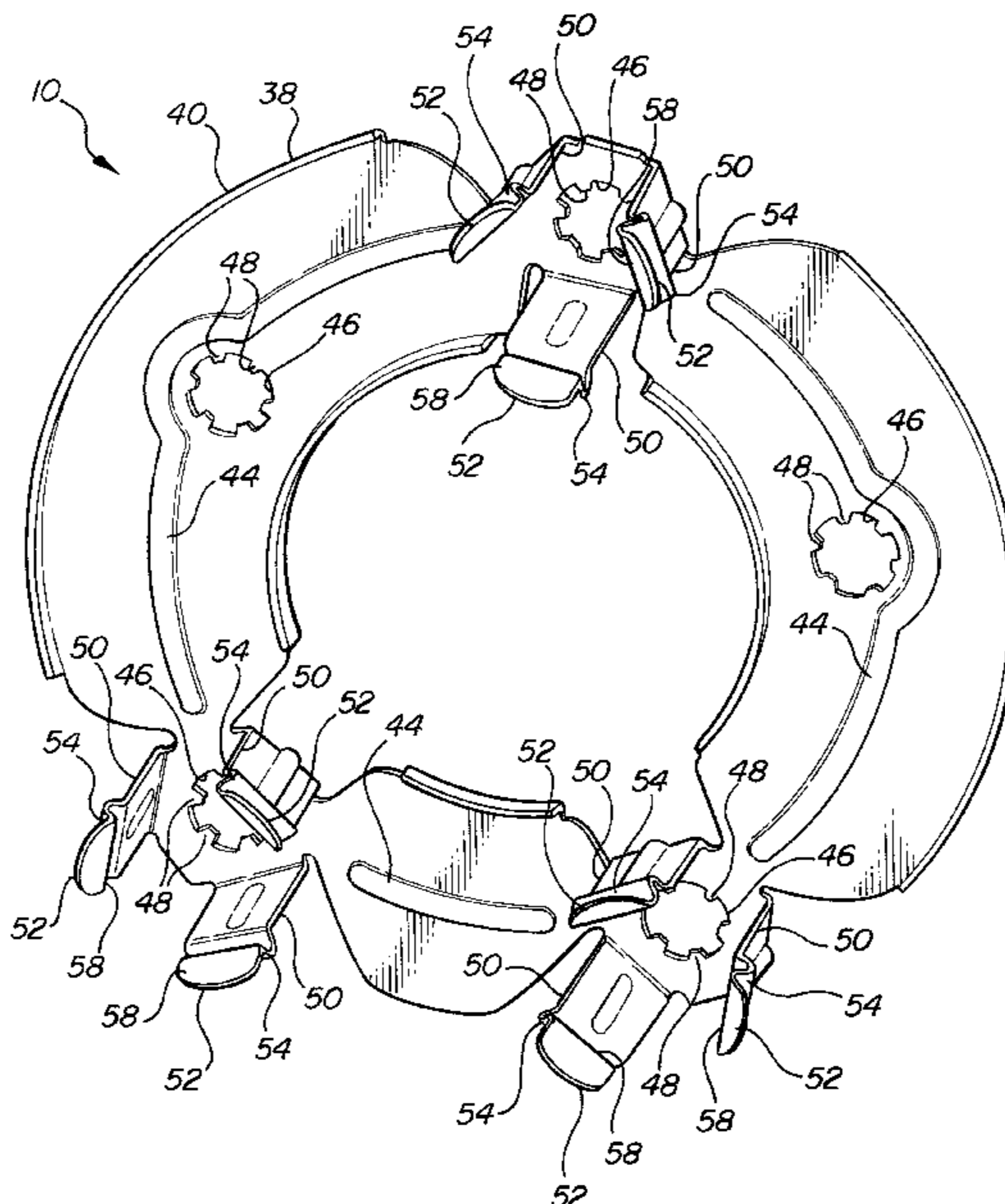
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(57) **ABSTRACT**

A retaining article secures ornamentation, namely wheel caps and wheel covers, to a wheel. The retaining article is a unitary structure. It is received by the ornamentation which has an inboard surface with a number of protrusions extending out therefrom. The protrusions are cylindrical in shape. The retaining article has a ring with a number of openings. The openings receive the protruding cylinders therein and are secured thereto by a number of tabs. The tabs are bent by the protruding cylinders. Legs extend out from the ring. The legs are forced over lug nuts which secure the wheel to a wheel hub. The legs engage a recess in the lug nuts creating a positive engagement with the lug nuts.

**10 Claims, 2 Drawing Sheets**



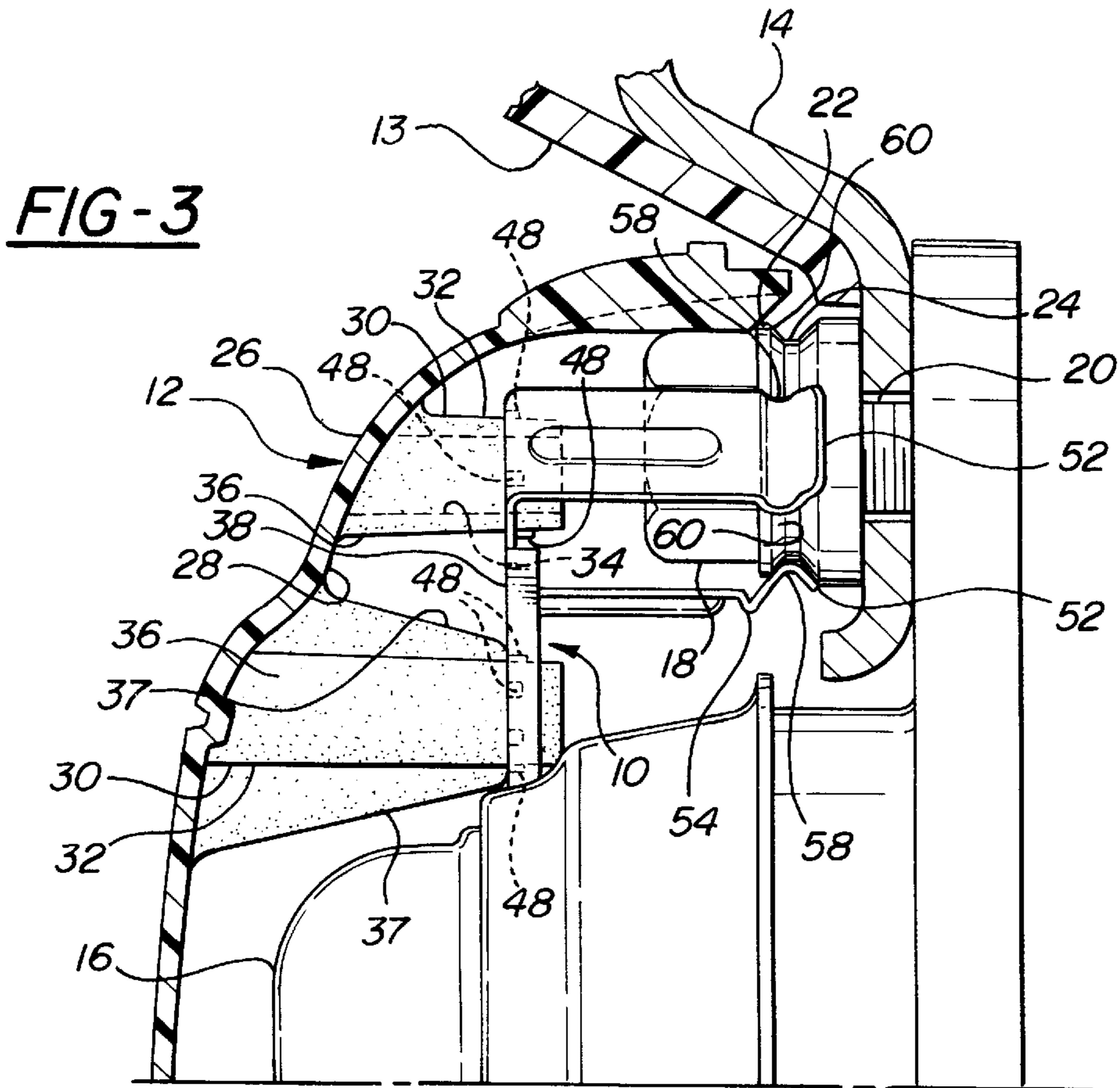
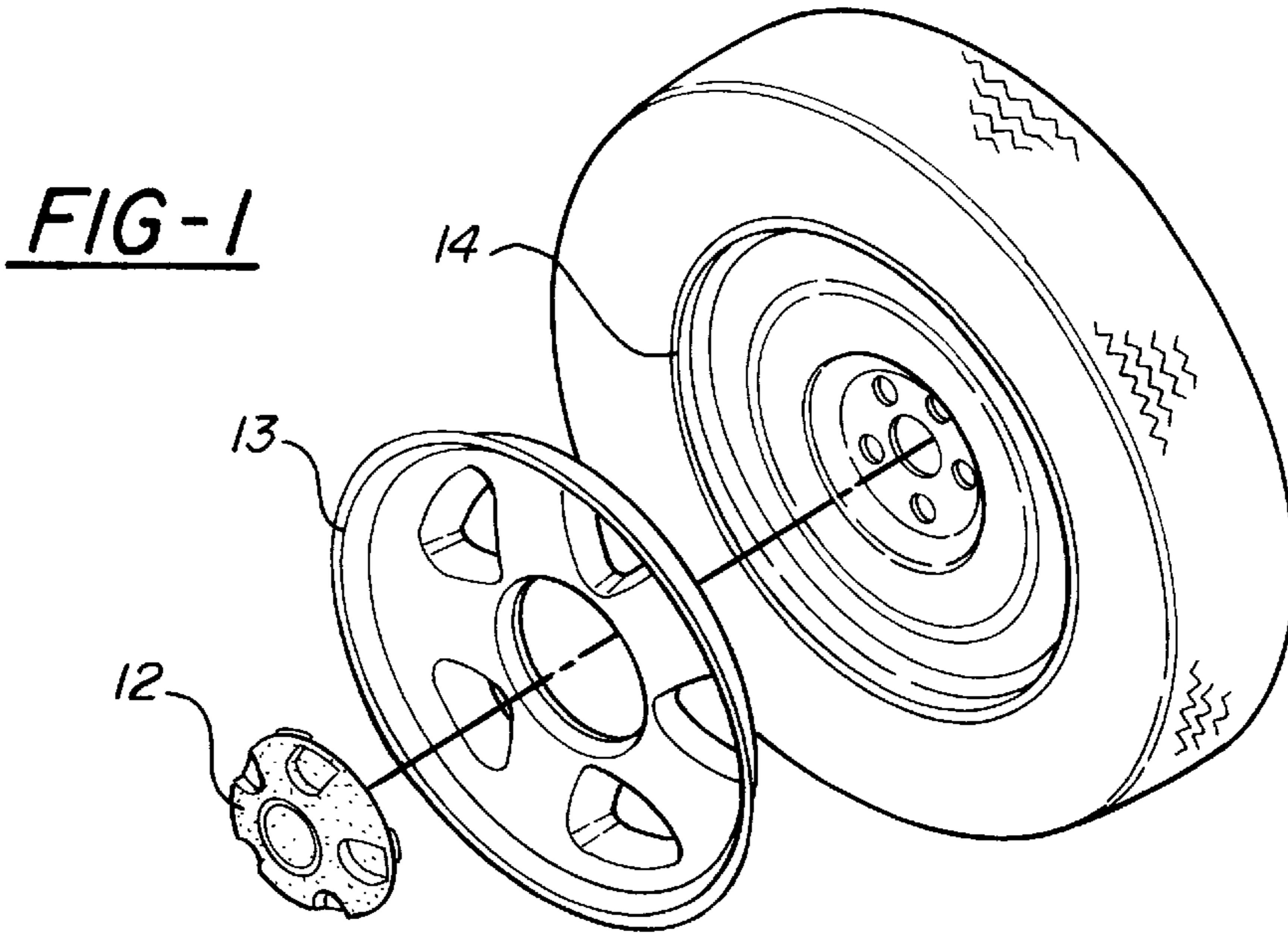
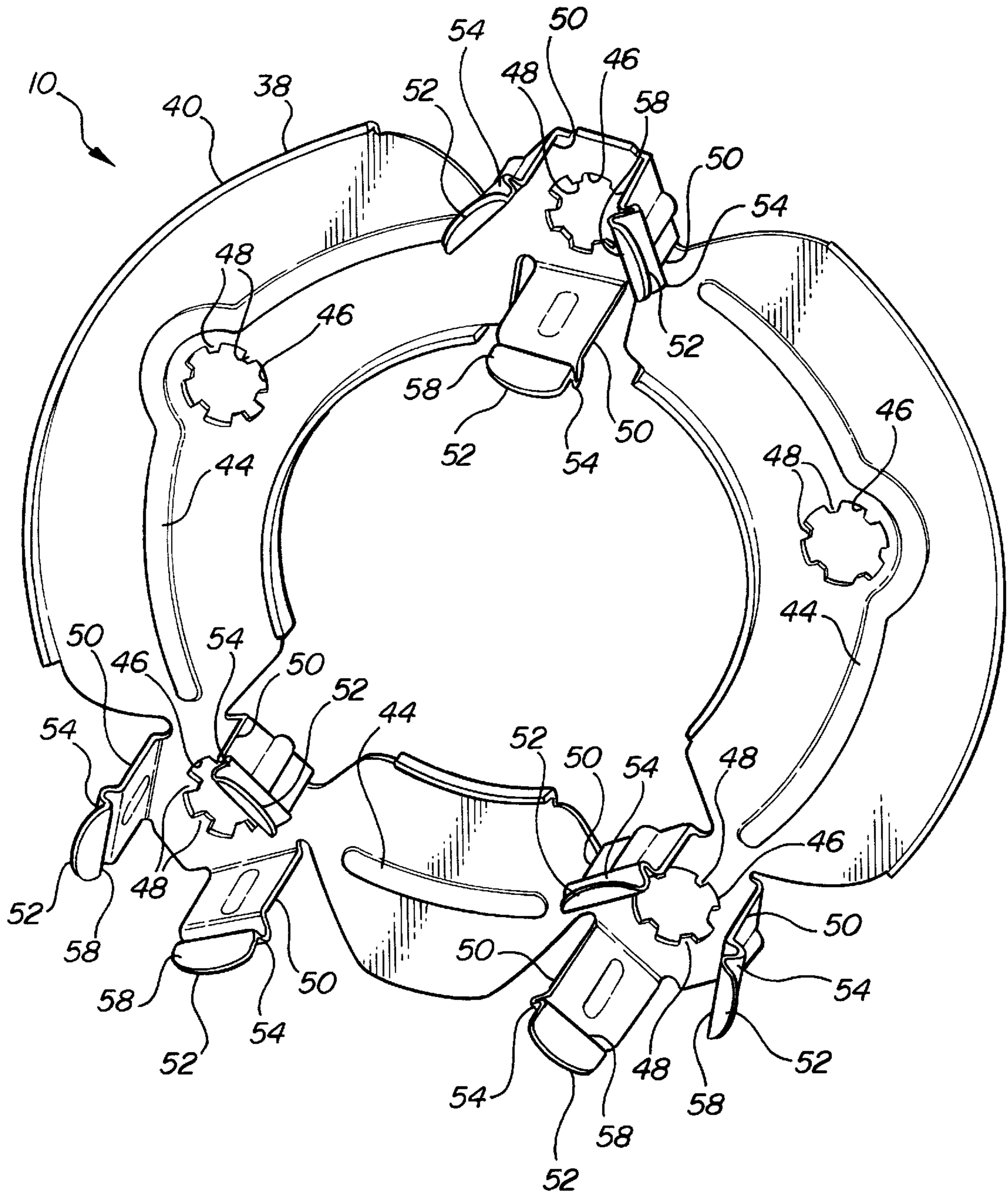


FIG-2



## RETAINING ARTICLE FOR WHEEL ORNAMENTATION AND METHOD OF MAKING

### BACKGROUND OF THE INVENTION

#### 1. Field of the Invention

The invention relates to ornamentation for vehicular wheels. More specifically, the invention relates to a retaining article for wheel caps and covers to secure them to the vehicular wheels.

#### 2. Description of the Related Art

Wheel ornamentation, such as wheel caps and covers (hereinafter "wheel covers") are aesthetic devices used to enhance the look of the wheels to which they are attached. Wheel covers are used because the manufacture, finish and mounting of a wheel cover to a wheel is less expensive than manufacturing a wheel having the same quality finish of a wheel cover. A chrome surface on a wheel cover is an inexpensive alternative to a chrome plated or polished wheel. In addition, wheel covers provide various types of appearances and styling variations, all of which may be combined with a single wheel design. The desirability of wheel covers is, however, directly proportional to the ability to inexpensively attach the wheel covers to the wheel permanently while adding little weight to the overall composite wheel.

U.S. Pat. No. 5,297,854, issued to Nielson et al. on Mar. 29, 1994, discloses a wheel cover retention system which incorporates a plurality of retainers secured to the wheel cover when it is mounted to a hollow protrusion extending out from the inboard surface of the wheel cover. The retainers receive lug nuts which hold the wheel in place. This system of wheel cover retention is undesirable because each retainer is an element independent of the other retainers. Inventory costs and assembly costs increase when dealing with so many pieces which fabricate a retention system.

U.S. Pat. No. 5,695,257, issued to Wright et al. on Dec. 9, 1997, discloses a retention system for a wheel cover. This system includes a ring having a number of attachments secured thereto allowing the wheel cover and the wheel to be attached to the ring keeping the wheel cover secured to the wheel. This system relies on bolts, nuts and attachment brackets. This system is undesirable because there are several parts to the system which require alignment and threading and the system is cumbersome to install and remove from the wheel. More specifically, for a user to access the wheel, the user must unbolt the four bolts which are shown holding the wheel cover to the ring and the four nuts shown securing the ring to the wheel. This task is tedious and undesirable.

### SUMMARY OF THE INVENTION

A retaining article is used to secure ornamentation, having an inboard surface defining a plurality of protrusions, to a wheel. The wheel is secured to a wheel hub with a plurality of lug nuts. The retaining article includes a ring defining an outer periphery and an inner periphery. A plurality of openings extend through the ring between the outer and inner diameters. The plurality of openings receive each of the plurality of protrusions extending out from the inboard surface of the ornamentation. The ring also includes a plurality of legs which extend out therefrom to engage the lug nuts securing the ornamentation to the wheel.

One advantage associated with the invention is the ability to secure ornamentation to a wheel of a motor vehicle.

Another advantage associated with the invention is the ability to secure ornamentation to a wheel using a single element or article. Yet another advantage associated with the invention is the ability to secure the ornamentation to the wheel using a single element thus reducing the assembly time. Still another advantage associated with the invention is the ability to secure ornamentation to a wheel using a single element in a manner such that the orientation of the retaining element is predisposed eliminating any requirements for alignment or orientation.

### BRIEF DESCRIPTION OF THE DRAWINGS

Other advantages of the invention will be readily appreciated as the same becomes better understood by reference to the following detailed description when considered in connection with the accompanying drawings, wherein:

FIG. 1 is a an exploded perspective view of a wheel, wheel cover and a wheel cap;

FIG. 2 is a perspective view of one embodiment of the invention; and

FIG. 3 is a cross-sectional side view partially cut away of one embodiment of the invention securing a wheel cap to a wheel.

### DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring to the Figures, a retaining article is generally indicated at **10**. The retaining article **10** is a unitary structure that retains ornamentation, generally indicated at **12**, to a wheel **14**. In the embodiment shown, the ornamentation **12** is a wheel cap. It should be appreciated by those skilled in the art that the retaining article **10** could be adapted to be used with other wheel ornamentation such as a wheel cover **13**. The wheel **14** is secured to a wheel hub **16** with lug nuts **18** which threadingly engage lug studs **20**. The lug nuts **18** include a ridge **22** and a recess **24**.

The wheel cap **12** defines an outboard surface **26** and an inboard surface **28**. Holes may extend between the outboard **26** and inboard **28** surfaces depending on the venting and aesthetic requirements. Typically, the outboard surface **26** is finished in a manner suitable for viewing by persons outside the motor vehicle to which the wheel cap **12** is attached. In many instances, it matches the appearance of the wheel cover **13**.

Extending out from the inboard surface **28** are a plurality of protrusions **30**. In the embodiment shown, the protrusions **30** are cylindrical in shape defining an outer protrusion surface **32** and an inner protrusion surface **34**. Depending on the material used to fabricate the wheel cap **12**, the thickness of the wall **36** of the protrusions **30** can only be approximately forty to fifty percent of the thickness of the wheel cap **12** between the inboard surface **28** and the outboard surface **26**. If the thickness of the wall **36** is greater, it will create recesses in the outboard surface **26** detracting from the aesthetic quality of the outboard surface **26**. Stop flanges **37** extend out from the wall **36** and will be discussed in greater detail subsequently.

The retaining article **10** includes a ring **38**, best seen in FIG. 2. The ring **38** defines an outer ring periphery **40** and an inner ring periphery **42**. The edges of the ring **38** are bent under to increase the strength of the ring **38** while minimizing sharp edges. A ring structural bend **44** extends around much of the ring **38** to aid in the strengthening of the ring **38**.

The ring **38** includes a plurality of openings **46**. The plurality of openings **46** receive the plurality of protrusions **30** therethrough locking the wheel cap **12** to the retaining article **10**. A number of tabs **48** extend into the openings **46**. The tabs **48** extend radially inwardly with respect to each of the openings **46**. The tabs **48** are spaced along the periphery of the openings **46** and will frictionally engage the outer protrusion diameter **32** of the protrusions **30**. The protrusions **30** bend the tabs **48** locking the wheel cap **12** to the retaining article **10**. The ring **38** is forced over the protrusions **30** until it abuts the stop flanges **37**. This abutment positions the ring **38** with respect to the lug nuts **18** to which the ring **38** will be secured.

Extending downwardly from the ring **38**, the retaining article **10** includes a plurality of legs **50**. The legs **50** extend out from the ring **38** and engage a portion of the lug nuts **18**. Each of the legs **50** is spring biased inwardly to resiliently engage the lug nuts **18** such that the retaining article **10**, and hence, the wheel cap **12**, are secured to the wheel **14**. Each of the legs **50** includes an outwardly extending distal end **52** which aids in the receipt of the lug nuts **18** into the retaining article **10**. Each of the legs **50** is in a group of legs associated with a single lug nut **18**. In the preferred embodiment, there are three legs **50** for each location that is to be secured to a lug nut **18**.

Each of the legs **50** includes a relief **54** which receives the ridge **22** on the lug nut **18**. Disposed adjacent the relief **54**, each of the legs **50** includes an indentation **58** which engages a chamfered surface **60** on the lug nut **18**. It is the contact between the indentation **58** and the chamfered surface **60** that secures the wheel cap **12** to the wheel **14** through the retaining article **10**.

The method for securing the wheel cap **12** to the wheel **14** using the retaining article **10** includes the step of stamping a piece of sheet metal to form a ring **38** having a plurality of openings **46**. The ring **38** is then cut and portions of the ring **38** are bent downwardly to create the plurality of legs **50** which extend out from the ring **38** in generally parallel direction with respect to the ring **38**. Structural bends **44** are pressed into the ring **38** to increase the strength thereof. The legs **50** are bent such that they are able to receive lug nuts **18** therein when the retaining article **10** is secured to the wheel **14**. The legs **50** are forced over the lug nuts **18**, used to secure the wheel **14** to the wheel hub **16**, to secure the retaining article **10** to the wheel **14**.

The invention has been described in an illustrative manner. It is to be understood that the terminology which has been used is intended to be in the nature of words of description rather than of limitation.

Many modifications and variations of the invention are possible in light of the above teachings. Therefore, within the scope of the appended claims, the invention may be practiced other than as specifically described.

What is claimed is:

**1.** A retaining article for securing ornamentation, having an inboard surface defining a plurality of protrusions, to a wheel secured to a wheel hub with a plurality of lug nuts, said retaining article comprising a ring defining an outer ring periphery, an inner ring periphery, a plurality of openings extending through said ring between said inner and outer ring peripheries for receiving each of the plurality of protrusions of the ornamentation therethrough, and a plurality of legs extending out from said ring at said outer ring periphery thereof engaging a portion of the lug nuts.

**2.** A retaining article as set forth in claim **1** wherein each of said plurality of openings includes a plurality of tabs to engage each of the protrusions upon passing therethrough to secure said retaining article to the ornamentation.

**3.** A retaining article as set forth in claim **2** wherein each of said plurality of legs is spring biased inwardly to resiliently engage a lug nut such that said retaining article is secured to the wheel.

**4.** A retaining article as set forth in claim **3** wherein each of said plurality of legs includes an outwardly extending distal end to receive the lug nut and allow each of said plurality of legs to pass over the lug nut as said retaining article is secured to the wheel.

**5.** A retaining article as set forth in claim **4** wherein each of said plurality of legs includes a leg structural bend to strengthen each of said plurality of legs.

**6.** A retaining article as set forth in claim **5** wherein said ring includes a ring structural bend therealong between said inner diameter and said outer diameter.

**7.** A retaining article as set forth in claim **6** wherein the ornamentation is a wheel cap.

**8.** A method for securing ornamentation to a wheel using a retaining article, the method comprising the steps of:

stamping a piece of sheet metal to form a ring having a plurality of openings;

cutting the ring;

bending portions of the ring downwardly to create a plurality of legs extending out from the ring generally parallel thereto;

forcing a portion of the ornamentation into each of the plurality of openings securing the ornamentation to the retaining article and the wheel;

bending the plurality of legs to receive the lug nuts when the retaining article is secured to a wheel; and

securing the retaining article to the wheel by forcing each of the plurality of legs over lug nuts used to secure the wheel to a wheel hub.

**9.** A method as set forth in claim **8** including the step of stamping structural bends therein to strengthen the ring.

**10.** A method as set forth in claim **9** including the step of stamping protrusions into each of the plurality of openings.

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